

5.5.15.1 Effects of Federal Non-Flow-Related Covered Activities

Non-flow-related covered activities (e.g., channel maintenance activities, construction and maintenance of roads, construction and maintenance of agricultural-related infrastructure, conversion of land to agriculture) could result in take of the burrowing owl. These activities would include actions that will disturb or remove earthen embankments associated with roads, canals, or other types of infrastructure that provide burrowing owl nesting habitat. This analysis assumes these activities will result in the loss of [] acres of burrowing owl nesting habitat associated with maintenance and removal of infrastructure. The actual amount of habitat that would be removed would be less, but maintenance activities are expected to affect all of the habitat over the 50-year term of the LCR MSCP. [Note to Reviewers: the extent of habitat effects associated with implementation of federal non-flow-related covered activities will be provided in the Draft LCR MSCP BA.] If these activities are conducted during the nesting season, they could result in mortality of individuals if these activities result in collapsing occupied nesting burrows. Operation of equipment and other maintenance- and restoration-related activities could also result in an unquantifiable level of harassment of burrowing owls if owls are present when these activities are undertaken.

Affects of non-flow-related covered activities on burrowing owl foraging habitat is expected to be minimal because the owls prefer to forage in grasslands, agricultural fields, and other open habitats, and the vast majority of lands that would be affected by these activities is unsuitable for the species (i.e., riparian woodland land cover types). In addition, available information about the status and trend of burrowing owl abundance in the LCR MSCP planning area indicates that the availability of agricultural foraging habitat may not be a factor limiting its abundance. For example, it is thought that the burrowing owl may have expanded into the LCR MSCP planning area with the expansion of agriculture because this species was not reported to be in the valley in the early part of the 20th century. The abundance of burrowing owls, while declining elsewhere in its range, appears to be increasing in western Arizona and southeastern California (Haug et al. 1993), including the LCR MSCP planning area. Based on this information, foraging habitat is not likely a factor limiting burrowing owls in the LCR MSCP planning area, and the possible removal of or disturbance to a small amount of foraging habitat associated with non-flow-related activities will not rise to the level of harm (i.e., injury or mortality).

Conversion of nonagricultural land cover types to agricultural land could increase the overall extent of agricultural foraging habitat in the LCR MSCP planning area by over 27,300 acres. Dirt embankments along new access roads, field margins, canals, and drains could also provide suitable nesting habitat.

5.5.15.2 Effects of LCR MSCP Implementation

Activities associated with creating/restoring and maintaining created/restored habitats may result in take of the burrowing owl. Conversion of agricultural land to restore covered species habitat and long-term maintenance-related activities associated with management of LCR MSCP conservation areas could include maintenance or removal of

earthen embankments associated with roads, canals, or other types of infrastructure that may support used by burrowing owls during the nesting and winter seasons. This analysis assumes these activities will result in the loss of 244 acres of burrowing owl nesting habitat associated with maintenance and removal of infrastructure. The actual amount of habitat that would be removed would be less, but maintenance activities are expected to affect all of the habitat over the 50-year term of the LCR MSCP. If these activities are conducted during the nesting season, they could result in mortality of individuals if these activities result in collapsing occupied nesting burrows. Operation of equipment and other maintenance- and restoration-related activities could also result in an unquantifiable level of harassment of burrowing owls if owls are present when these activities are undertaken.

Up to 8,132 acres of foraging habitat could be lost as a result of converting agricultural lands to restore habitats for covered species, representing up to 3% of agricultural lands present in the LCR MSCP planning area. Available information about the status and trend of burrowing owl abundance in the LCR MSCP planning area indicates that the availability of agricultural foraging habitat, however, may not be a factor limiting its abundance. For example, it is thought that the burrowing owl may have expanded into the LCR MSCP planning area with the expansion of agriculture because this species was not reported to be in the LCR MSCP planning area in the early part of the century. The abundance of burrowing owls, while declining elsewhere in its range, appears to be increasing in western Arizona and southeastern California (Haug et al. 1993), including the LCR MSCP planning area. Based on this information, foraging habitat is not likely a factor limiting burrowing owls in the LCR MSCP planning area, and the removal of foraging habitat associated with non-flow-related activities will not rise to the level of harm (i.e., injury or mortality).

The MSCS Conservation Plan includes measures to avoid and minimize the potential for direct take of burrow owls by either avoiding occupied burrows or removing owls from burrows before activities that could affect occupied burrows are implemented.

5.5.16 Elf Owl

5.5.16.1 Effects of Flow-Related Covered Activities

Flow-related activities may result in take of the elf owl. Changes in points of diversion in Reaches 3–5 will lower groundwater levels sufficiently in these reaches to reduce the extent or quality of 161 acres of elf owl habitat (Table 5-3).

5.5.16.2 Effects of Federal Non-Flow-Related Covered Activities

Operation of equipment to implement non-flow-related covered activities (e.g., implementation of channel, settling basin, boat ramp, gage station, and other facility maintenance activities; implementation of marsh restoration projects; conversion of lands to agriculture) could result in take of the elf owl. Noise, artificial lighting, and dust may

young birds are not present. Effects on habitat would be temporary for restoration projects that restore or improve existing California black rail habitat. These activities are expected to result in some low, unquantifiable, level of take over the term of the LCR MSCP. The level of adverse effects on habitats and individuals will depend on the extent of habitat that is restored or maintained in species habitat.

Operation of law enforcement patrol boats to enforce no-wake zone regulations that protect habitat (e.g., the Bill Williams Delta) will also generate boat wakes in the no-wake zones for short periods when other watercraft are being pursued. During the breeding season, boat wakes could swamp nests, potentially resulting in mortality of eggs or nestlings. Because the frequency with which such incidents occur (AGFD estimates 150–200 person-days are expended annually enforcing no-wake zone regulations in the LCR MSCP planning area) and the duration with which patrol boats generate boat wakes in protected habitat (i.e., the period required to stop a boat) are likely low, and therefore a low, unquantifiable, level of take is expected.

5.6.14 Yellow-Billed Cuckoo

Proposed activities related to riparian restoration maintenance and restoration projects along the LCR in the LCR MSCP planning area may result in take of the yellow-billed cuckoo. The likelihood for take is expected to increase over the term of the LCR MSCP if the abundance of yellow-billed cuckoo increases in the LCR MSCP planning area as a result of implementing LCR MSCP conservation measures for this species. Restoration-related activities, such as operation of equipment to remove vegetation, could result in temporary loss of habitat and harassment of individuals if individuals are present and activities are undertaken during the breeding season. Effects on habitat would be permanent for restoration projects that removed habitat to restore land cover types that are not used by the yellow-billed cuckoo. The probability for permanent loss of habitat is considered minimal because riparian restoration maintenance projects undertaken in existing yellow-billed cuckoo habitat will presumably be designed to maintain or improve its habitat, and it is unlikely that state fish and wildlife agencies would remove yellow-billed cuckoo habitat to restore habitat for other species. These activities are expected to result in some low, unquantifiable, level of take over the term of the LCR MSCP.

5.6.15 Burrowing Owl

Proposed activities related to maintenance of water conveyance and supply infrastructure (e.g., canals) and riparian restoration projects may result in take of the burrowing owl. Water conveyance and supply infrastructure and riparian restoration projects could include maintenance or removal of earthen embankments associated with roads, canals, or other types of infrastructure that provide burrowing owl nesting habitat. This analysis assumes these activities will result in the loss of up to 485 acres of burrowing owl nesting habitat associated with maintenance and removal of infrastructure. The actual amount of habitat that would be removed would likely be less, but maintenance activities are projected to affect all of the habitat over the 50-year term of the LCR MSCP. [Note to Reviewers: The estimate of the extent of habitat loss is based on an estimate of Palo

Verde Irrigation District's activities to maintain and replace 400 miles of canals, drains, spill channels, and private drains over the 50-year term. The extent of habitat effects that could be associated with implementation of other nonfederal non-flow-related maintenance and replacement activities is not included in this estimate because data have not been provided by the applicants. The effects of these other nonfederal maintenance and replacement activities will be included in the next draft of the LCR MSCP BA.] If these activities are conducted during the nesting season, they could result in mortality of individuals if these activities result in collapsing occupied nesting burrows. Operation of equipment and other maintenance- and restoration-related activities could also result in an unquantifiable level of harassment of burrowing owls if owls are present when these activities are undertaken.

Riparian restoration projects that convert agricultural lands used by burrowing owls could result in the loss of foraging habitat. The quantity of agricultural lands that could be converted to riparian land cover has not been identified but is expected to represent only a small fraction of the 270,594 acres of agricultural lands present in the LCR MSCP planning area. In addition, available information about the status and trend of burrowing owl abundance in the LCR MSCP planning area indicates that the availability of agricultural foraging habitat may not be a factor limiting its abundance. For example, it is thought that the burrowing owl may have expanded into the LCR MSCP planning area with the expansion of agriculture because this species was not reported to be in the valley in the early part of the 20th century. The abundance of burrowing owls, while declining elsewhere in its range, appears to be increasing in western Arizona and southeastern California (Haug et al. 1993), including the LCR MSCP planning area. Based on this information, foraging habitat is not likely a factor limiting burrowing owls in the LCR MSCP planning area, and the removal of foraging habitat associated with non-flow-related activities will not rise to the level of harm (i.e., injury or mortality).

5.6.16 Elf Owl

Proposed activities related to riparian restoration maintenance and restoration projects in the LCR MSCP planning area may result in take of the elf owl. The likelihood for take is expected to increase over the term of the LCR MSCP if the abundance of elf owl increases in the LCR MSCP planning area as a result of implementing LCR MSCP conservation measures for this species. Restoration-related activities, such as operation of equipment to remove vegetation, could result in temporary loss of habitat and harassment of individuals if individuals are present and activities are undertaken during the breeding season. Effects on habitat would be permanent for restoration projects that removed habitat to restore land cover types that are not used by the elf owl. The probability for permanent loss of habitat is considered minimal because riparian restoration maintenance projects undertaken in existing elf owl habitat will presumably be designed to maintain or improve its habitat, and it is unlikely that state fish and wildlife agencies would remove elf owl habitat to restore habitat for other species. These activities are expected to result in some low, unquantifiable, level of take over the term of the LCR MSCP.

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EVALUATION OF PETITION:
REQUEST OF THE CENTER FOR BIOLOGICAL DIVERSITY ET AL. TO LIST
THE WESTERN BURROWING OWL
(*Athene cunicularia hypugaea*)
AS A THREATENED OR ENDANGERED SPECIES

October 2003

Introduction

The Center for Biological Diversity, along with the Santa Clara Valley Audubon Society, Defenders of Wildlife, San Bernardino Valley Audubon Society, California State Park Rangers Association, and the Tri-County Conservation League submitted a petition to the Fish and Game Commission on April 8, 2003, seeking action to list the Western Burrowing Owl (*Athene cunicularia hypugaea*) as a threatened or endangered species under the California Endangered Species Act ("CESA"; Fish & Game Code, §2050-2116).

CESA specifically requires the Department to "evaluate the petition on its face and in relation to other relevant information the Department possesses or receives," and to recommend to the Commission whether the petition contains sufficient information to indicate the petitioned action may be warranted (Fish & Game Code, §2073.5(a); see also California Code of Regulations, title 14, §670.1, subd. (d)(1)). "Sufficient information" means "that amount of information ... that would lead a reasonable person to conclude the petitioned action may be warranted." (*Natural Resources Defense Council v. Fish and Game Commission* (1994) 28 Cal.App. 4th 1104, 1119.) "May be warranted" means a substantial possibility that listing could occur." (*Id.* at p. 1125.) Therefore, the Department's standard in developing its recommendation is whether there is "sufficient information", meaning enough information that would lead a reasonable person to conclude, that there is a substantial possibility that the requested listing could occur. In accordance with these requirements, this report evaluates the information provided in the petition, as well as other available information, and includes the Department's recommendation as to whether listing may be warranted.

The petition provides an adequate description of life history traits of the WBO, and cites studies that provide more detailed life history information. Life history information is described in the petition under the heading "Ecology of the Western Burrowing Owl" and is summarized below.

Taxonomy

The WBO (*Athene cunicularia hypugaea*) is one of two subspecies of burrowing owl (*Athene cunicularia*) that occur in North America. The other subspecies *A. c. floridana* occurs in Florida and on the Bahama Islands. The

prevent impacts from discing to active burrows, there is now some protection afforded under an Integrated Natural Resource Management Plan (INRMP) for the base. The East Otay Mesa population is located in an area of ongoing disturbance by Border Patrol activities and primarily located in areas zoned for future development. Outside of these locations, there are estimated to be between 5 – 15 breeding pairs in the county. This population estimate was developed from a county-wide effort, collected over the course of five consecutive years and completed in 2002, as part of the San Diego Bird Atlas Project, coordinated by Philip Unitt of the San Diego Natural History Museum.

Wintering burrowing owls are reported each year in San Diego County. These records are usually of single birds or a few individuals. Recent wintering sites include Carlsbad golf course, Batiquitos Lagoon, Whelan Lake, Dennery Canyon, Mission Bay/San Diego River Flood Channel, Rancho Jamul Ecological Reserve, and the Ramona region.

Imperial Valley

Burrowing owl populations in the Imperial Valley have increased with the intensification of agricultural activity, from originally sparse numbers (Garrett and Dunn 1981, DeSante et al. in press). Burrowing owls in this region currently appear to attain some of the highest densities recorded for the species. This population may comprise over 70% of the known breeding owls in California estimated at between 5,600 – 6,571 pairs (DeSante et al. 1996). Research and surveys indicate that in California burrowing owl populations are declining in areas with the greatest urban growth while larger populations occur in areas of intensive agriculture (e.g., Gervais et al. 2003, Rosenberg and Haley 2003), or designated open space.

Coachella Valley

Coachella Valley occurred within DeSante's survey area but a WBO population was missed. Data gathered during the development of a conservation plan for the Coachella Valley indicate an extant population (74 observation records both historic and current see Figure 5). An estimated 10-20 breeding pairs are scattered over the lower end of the valley and on some of the preserves developed by the Coachella Valley Mountain Conservancy (C. Barrows, pers. comm. 2003)(Figure 3).

Southern Desert Range

The Palo Verde Valley, located in eastern Riverside County was outside of the survey area (described in the petition as the eastern 50% of Riverside County), described as similar to the Imperial Valley in agricultural practices (N. Andrew CDFG, pers. comm. 2003), and is the second largest burrowing owl core population area in southern California. It is estimated that 500-1000 pairs of

burrowing owls occupy the Palo Verde Valley at this time (J. Kidd, pers. comm. 2003). The petition references DeSante et al. (1996) and describes this area as the southern desert range and that burrowing owls in this range occur as small, scattered populations, and have historically never been common. The Department agrees with this description in areas of semi-natural habitat. However, the Palo Verde Valley and Bard Valley (Imperial County) to the south are similar to Imperial Valley in regards to agricultural practices and hence have the potential to support higher densities of burrowing owls. In order to further quantify the extent of these populations, a systematic survey of the burrowing owl populations is needed within these valleys. Also, within the southeastern desert area described in the petition, personal communication with Mr. Tom Campbell (Biologist, China NWF, approximately 500,000 acres) indicates that a population of breeding burrowing owls occurs on the base. A comprehensive survey has not been conducted; however anecdotal information from Mr. Campbell indicates that WBO are seen on a fairly regular basis, particularly in the deserts surrounding Ridgecrest.

California Department of Fish and Game Lands

A database query was made regarding all of the Department's lands that either have records of burrowing owls or that have potentially suitable WBO habitat. A total of 64 properties were found to have these attributes.

California Natural Diversity Database

The Department's California Natural Diversity Database records for burrowing owls contain 590 element occurrence records. An element occurrence is defined for burrowing owls as a burrow site. Records that were submitted without identifying a burrow site are not included in the database. The database points are spatially illustrated in Figure 5.

Habitat Necessary for Survival

The petition included a thorough description of the habitat necessary for survival of the WBO. The habitat necessary for survival is described in the petition under the heading "Habitat Requirements".

Suitable habitats for the WBO are identified in the California Wildlife Habitat Relationship (WHR) program (a general listing of habitats within the range of a species, see Figure 4 for WHR WBO range). The WHR indicates "that the species is a yearlong resident of open, dry grassland and desert habitats, and in grass, forb and open shrub stages of pinyon-juniper and ponderosa pine habitats. The Department agrees with the petition that little of the native perennial grasslands or native prairie habitat within California remains. A recent mapping project conducted by Chico State University (2003) reports that grassland land cover type decreased in the Central Valley from 7,085,483 acres

estimated as occurring during the pre-1900 time period compared to 3,198,301 acres estimated for the present (Table 1). Although this grassland cover type is predominately annual grass and not native prairie, it does provide potential WBO habitat and hence indicates the extent of the land cover change over the last century. However, as noted earlier, all grassland type habitats are not suitable WBO habitat.

The WBO nesting habitat consists of open areas with mammal burrows. The WBO is a habitat generalist and is capable of surviving within urban fringe and intense agricultural production landscapes. The burrow is paramount for habitat suitability, as well as low vegetation cover adjacent to the burrow. WBO uses a variety of arid and semi-arid environments, with well drained, level to gently sloping topography characterized by sparse vegetation and bare ground. Owls readily nest along agricultural water conveyance canals surrounded by crops (Rosenberg and Haley 2003). The WBO also are found nesting along roadsides, adjacent to airport runways, urban parks, golf courses, athletic fields, and railroad beds. The primary habitat characteristics tend to be the presence of burrows for roosting and nesting, and vegetation structure that is relatively short and perches if vertical habitat structure limits visibility.

Burrows are usually provided by ground squirrels (California ground squirrel and round tailed ground squirrel) which the owls reshape to fit their needs. WBO have also been observed to use the following sites for nesting or roosting; badger holes, coyote dens, sand dune cavities under ice plant, drift wood piles, culverts, concrete rubble piles, rock outcrops and stand pipes. WBO can also excavate their own burrows in soft soils adjacent to agricultural irrigation canals (J.A. Gervais, personal observation). Gleason (1978) and Gleason and Johnson (1985) also found that where mammal burrows is scarce, WBO have been found nesting in natural rock and lava cavities.

The WBOs tend to forage close to their burrow during the nesting season, usually staying within a few hundred to a thousand meters (Haug and Oliphant 1990, Sissons et al. 2001, Gervais 2002, Gervais et al. 2003, Rosenberg and Haley 2003). Foraging owls have been detected up to 2.7 km from the nest burrow during other times of the year (Haug and Oliphant 1990). In the Central Valley of California, owls used all available cover types close to the nest burrow and did not indicate any avoidance of specific crop cover types (Gervais et al. 2003). Over 80% of the feeding observations made during a research study in the Central and Imperial Valleys (Gervais et al. 2003, Rosenberg and Haley 2003) were made during the breeding season and occurred within 600 meters of the nest burrow.

Abundance

The petition contains a comprehensive review by county of the abundance of the WBO. Abundance information is described in the petition under the

causing a contraction of WBO breeding range. This research also provides evidence of population connectivity between the Carrizo Plain, the south Bay area, and NAS Lemoore WBO populations. Also, these same studies by Gervais (2002) and Rosenberg and Haley (2003) revealed that the number of breeding pairs of burrowing owls at the Lemoore and the Imperial study sites stayed fairly constant between 1997 and 2000 despite fairly high variation in production and survival rates.

Population Trend Summary

The petition relied on historic and current scientific literature, along with expert opinion, to describe the WBO population in California. In conducting its analysis for this report, the Department carefully reviewed the same information as cited by the petitioners. The Department agrees that the scientific evidence indicates WBO populations have declined in portions of their range when contrasted with historic accounts, though the exact magnitude of the historic decline is not known and has not been quantified. Currently, the best available scientific information from more recent studies indicates a decline of 60% of the breeding groups of burrowing owls known to have existed within the research survey area between the 1980s and the early 1990s (DeSante and Ruhlen 1995). Within the highly developed urban landscapes open space lands such as industrial parks, airports and rail yards, tend to maintain populations of burrowing owls due to the adaptive behavioral characteristics of WBO. Also, due to the lack of WBO surveys in the arid desert environs of California (representing approximately 40% of their range), insufficient data exists to evaluate the extent of their populations where low density populations occur. Therefore, due to the fact that a large extent of the WBO populations occur in core populations (such as the Lemoore, Carrizo, and Imperial Valley study sites) that are stable, the Department at this time does not believe that the declining populations within highly developed portions of their range jeopardize the overall stability of the State population.

Key finding

Factors Affecting the Ability of the Population to Survive and Reproduce

The petition provides sufficient scientific information on factors affecting the ability of the population to survive and reproduce. Though the petition does not actually contain a heading with this title, it is covered under the heading "VIII Nature, Degree, and Immediacy of Threat". The petition states "The burrowing owl is a species in crisis throughout most of its range in California. DeSante and Ruhlen (1995) estimated that at least 50% of the state's owl population was lost in the previous decade in both urban and agricultural areas of the state." Further the petition states that this loss is documented to be at a rate of approximately 8% per year. As stated previously, burrowing owls are believed to be extirpated in 5 counties, nearly extirpated from 6 additional counties as well as from portions of 4 counties.

The apparent main threats to burrowing owls are the loss of suitable habitat due to urban development and eradication of ground squirrels. Most of the extirpated populations identified by DeSante et al. (1997, unpublished data) occur within counties along the coast. These coastal counties have experienced tremendous growth over the last few decades. Urban development is also increasing in the Central Valley, and loss of agricultural and other open landscapes is likely to impact owl populations. Burrowing owls do persist in urban environments but in an unnatural and somewhat unstable condition due to the increased number of threats associated with living adjacent to urban areas (vehicles, pesticides, and domestic animals). However, Millsap and Bear (2000) indicated that lower density development appeared to benefit the owls due to increased prey availability around homes, and reduced mortality from natural causes (Millsap and Bear 2000).

Another identified risk for burrowing owls within developed landscapes is mortality caused by traffic (Konrad and Gilmer 1984, Haug and Oliphant 1997, Clayton and Schmutz 1997, Millsap 2002, D. K. Rosenberg et al., unpublished data). It would appear that burrowing owls nesting along roadsides or parking lots could be at greatest risk, however owls have been observed to forage along roads over 1 km from the nest burrow (J. A. Gervais, personal observation). Very little road kill data is collected so it is difficult to evaluate this subject.

Pesticides are likely to impact burrowing owl populations living in heavily agricultural environments (James and Fox 1987, James et al. 1990). In the Central Valley, however, there was no indication that foraging owls selected fields recently treated for pesticides, although owls did use crops extensively during foraging activities (Gervais et al. 2003). Some owls likely die of pesticide exposure, and some owls carry body burdens of persistent contaminants such as DDE that may impair reproduction or survival (Gervais et al. 2000). An analysis of the potential impacts of pesticide exposure rates on population growth rate suggested negligible effects (Gervais 2002, Gervais and Anthony in press).

The largest populations of burrowing owls remaining in California occur in agricultural environments. In addition to possible pesticide exposure, these owls are potentially vulnerable to land use practices. Discing to control weeds in fallow fields may destroy burrows, and the management of water conveyance structures will determine whether burrows persist through the breeding season (Rosenberg and Haley 2003). Ironically, the high density of owls present in the Imperial Valley is almost certainly due to agricultural development (Rosenberg and Haley 2003). A HCP for the Imperial Valley area has been drafted and includes mitigation measures for burrowing owls and monitoring requirements. Of the three basic canals engineered to deliver water to the Imperial Valley, the secondary canals that branch off of the three main canals provide the primary burrowing owl nesting habitat. The configuration of the secondary canals including the height and slope of the berms apparently provides more suitable habitat than either the larger primary canals or the smaller tertiary canals. The